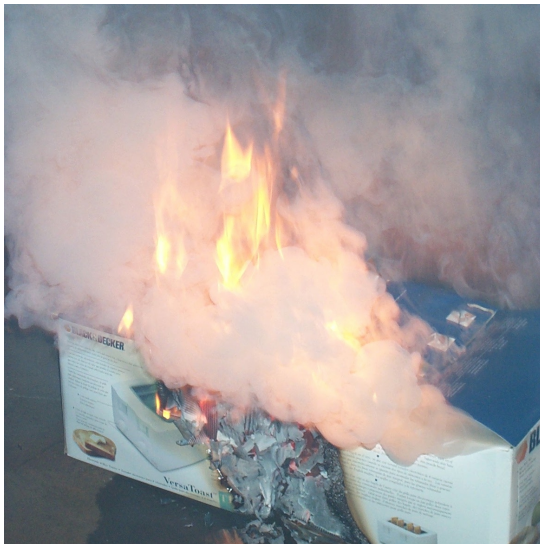# DC-ARM Early Warning Fire Detection

## Naval Fire Detection

Significant human resources are currently devoted to damage control.

Automation of ship functions and damage control systems requires:

Improved fire detection systems:

- Faster Fire Detection
- Fewer false alarms



## Approach

### Multi-criteria Fire Detection System

- Measure different parameters: physical and chemical
- Develop a response pattern or fingerprint of an event
- Multivariate data analysis to recognize events of interest
- Probabilistic Neural Network provides the probability of fire
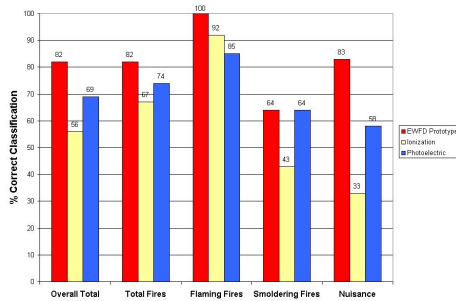
### • Real-time Prototype Tests

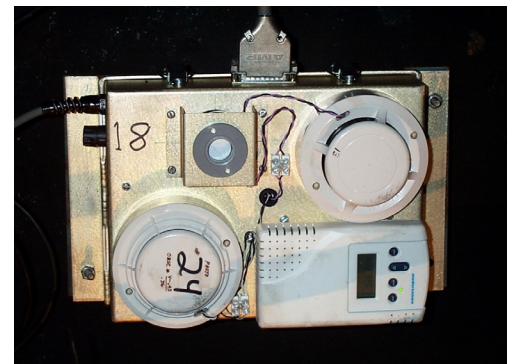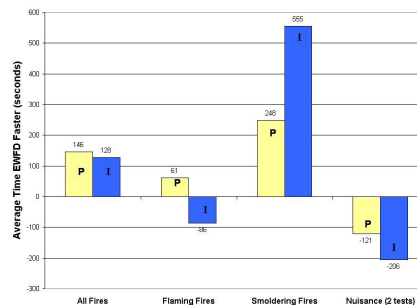Sensor cluster composed of: Ionization, Photoelectric, Carbon Monoxide, Carbon Dioxide

- Warning 75% probability level
- Alarms 85% probability level

Fire detector responses processed in real-time using **Labview** and **MATLAB** with the PNN trained with all the data previously collected.



## Classification Results



## Comparison of Response Times





## Results

- Faster response to fires
- Fewer nuisance alarms (reduced "false positives")